

# Model MKF 115 | Dynamic climate chambers for rapid temperature changes with humidity control

A BINDER MKF series environmental simulation chamber is ideally suited for any cold and heat testing based on current temperature and climate testing methods according to DIN and IEC standards. The comprehensive standard equipment for this environmental simulation chamber ensures ease of operation.

## BENEFITS

- Homogeneous climate conditions thanks to APT.line™ technology
- Automatic water and wastewater management
- Pressure humidification with fast response times
- Comprehensive programming and data acquisition
- Large heated viewing window



Model 115



Model 115

## MAIN FEATURES

- Temperature range: -40 °C to 180 °C
- Humidity range: 10 % to 98 % RH
- Integrated water-storage tank, 20 liters (Models 115, 240, 720)
- 4 zero-voltage relay contacts
- 1 stainless steel rack
- APT.line™ preheating chamber technology
- Intuitive touchscreen controller with time-segment and real-time programming
- Internal data logger, measured values can be read out in open format via USB
- Programmable condensation protection for test material
- Heated viewing window with LED interior lighting
- Humidity regulation with capacitive humidity sensor and vapor humidification
- BINDER Multi Management Software APT-COM™ Basic Edition
- Troubleshooting system with visual and audible alarms
- Access port with silicone plug (Models 56, 115, 240: 50 mm, left)
- 2 access ports with silicone plugs (Model 720: 80 mm, left and right)
- Class 2 independent adjustable temperature safety device (DIN 12880) with visual alarm
- 4 castors, two with brakes
- Computer interface: Ethernet
- 230 V power socket on the right-side control panel (Models 115, 240, 720)
- Adjustable ramp function
- Integrated chart recorder
- Real-time clock
- Door heating
- Alarm notification in the event of insufficient water in fresh water tank (Models 115, 240, 720)
- Complete safety connection kit for water supply and drainage, up to 1 m height
- Inner chamber made of stainless steel
- CFC-free refrigerant R-404A
- Cooling with compressor cooling unit

## ORDERING INFORMATION

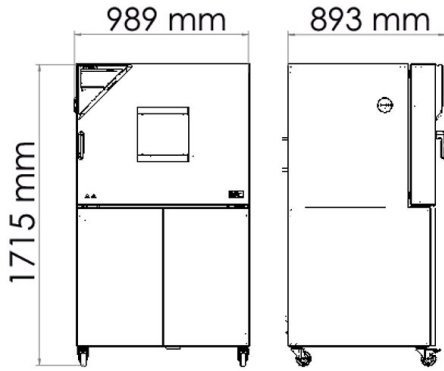
| Interior volume [cu.ft.] | Voltage        | Option model                         | Version       | Art.-No.  |
|--------------------------|----------------|--------------------------------------|---------------|-----------|
| 4.1                      | 400 V 3~ 50 Hz | Standard                             | MKF115-400V   | 9020-0379 |
|                          | 480 V 3~ 60 Hz | with voltage and frequency converter | MKF115-480V-C | 9020-0357 |

## TECHNICAL DATA

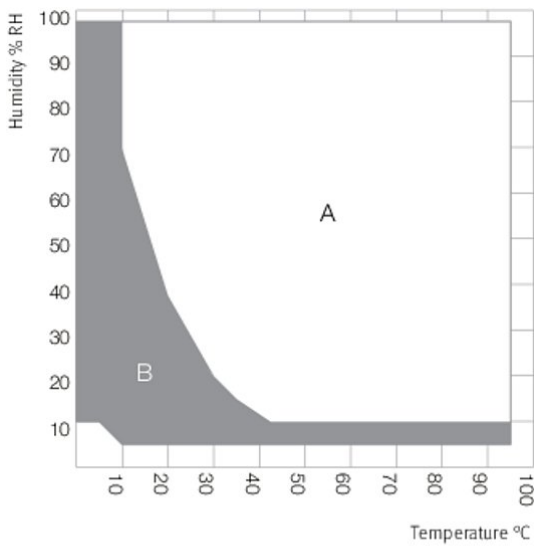
| Description  | MKF115-400V <sup>1</sup> | MKF115-480V-C <sup>1</sup> |
|--|--------------------------|----------------------------|
| Article Number   | 9020-0379                | 9020-0357                  |
| <b>Performance Data Temperature</b>                          |                          |                            |
| Temperature range  | -40...180                | -40...180                  |
| Temperature variation depending on setpoint [± K]            | 0.1...1.3                | 0.1...1.3                  |
| Temperature fluctuation depending on setpoint [± K]          | 0.1...0.6                | 0.1...0.6                  |
| Average heating-up rate according to IEC 60068-3-5 [K/min]   | 5.5                      | 5.5                        |
| Cooling down time from 180 °C to -40 °C [min]                | 100                      | 100                        |
| Average cooling down time according to IEC 60068-3-5 [K/min] | 4.5                      | 4.5                        |
| Max. heat compensation at 25 °C [W]                          | 2100                     | 2100                       |
| <b>Performance Data Climate</b>                              |                          |                            |
| Temperature range [°C]                                       | 10...95                  | 10...95                    |
| Temperature fluctuation depending on setpoint [± K]          | 0.1...1.3                | 0.1...1.3                  |
| Humidity range [% RH]  | 10...98                  | 10...98                    |
| Humidity fluctuation depending on setpoint                   | ≤2,5 ± % RH              | ≤2,5 ± % RH                |
| Dew point temperature range [°C]                             | 5...94                   | 5...94                     |
| <b>Electrical data</b>                                       |                          |                            |
| Rated Voltage [V]  | 400                      | 480                        |
| Power frequency [Hz]   | 50                       | 60                         |
| Nominal power [kW]   | 4.8                      | 4.8                        |
| Unit fuse [A]  | 16                       | 16                         |
| Phase (Nominal voltage)                                      | 3~                       | 3~                         |
| <b>Measures</b>  |                          |                            |
| Interior volume [cu.ft.]                                     | 4.1                      | 4.1                        |
| Net weight of the unit (empty) [lbs]                         | 617                      | 472                        |
| Permitted load [lbs]   | 132                      | 132                        |
| Load per rack [lbs]  | 66                       | 66                         |
| Viewing window width [in]                                    | 11.35                    | 11.35                      |
| Viewing window height [in]                                   | 8.75                     | 8.75                       |
| Wall clearance back [in]                                     | 11.82                    | 11.82                      |
| Wall clearance sidewise [in]                                 | 7.88                     | 7.88                       |
| <b>Internal Dimensions</b>                                   |                          |                            |
| Width [in]   | 23.64                    | 23.64                      |
| Height [in]  | 18.91                    | 18.91                      |
| Depth [in]   | 15.76                    | 15.76                      |
| <b>Doors</b>   |                          |                            |
| Unit doors   | 1                        | 1                          |
| <b>Housing dimensions not incl. fittings and connections</b> |                          |                            |
| Width net [in]   | 38.61                    | 38.61                      |
| Height net [in]  | 68                       | 68                         |
| Depth net [in]   | 34.08                    | 34.08                      |
| <b>Environment-specific data</b>                             |                          |                            |
| Sound-pressure level [dB(A)]                                 | 62                       | 67                         |
| <b>Fixtures</b>  |                          |                            |
| Number of shelves (std./max.)                                | 1/4                      | 1/4                        |

1 All technical data is specified for unloaded units with standard equipment at an ambient temperature of +22 °C ±3 °C and a power supply voltage fluctuation of ±10 %. The temperature data is determined in accordance to BINDER factory standard following DIN 12880, observing the recommended wall clearances of 10 % of the height, width, and depth of the inner chamber. Technical data refers to 100 % fan speed. All indications are average values, typical for units produced in series. We reserve the right to change technical specifications at any time.

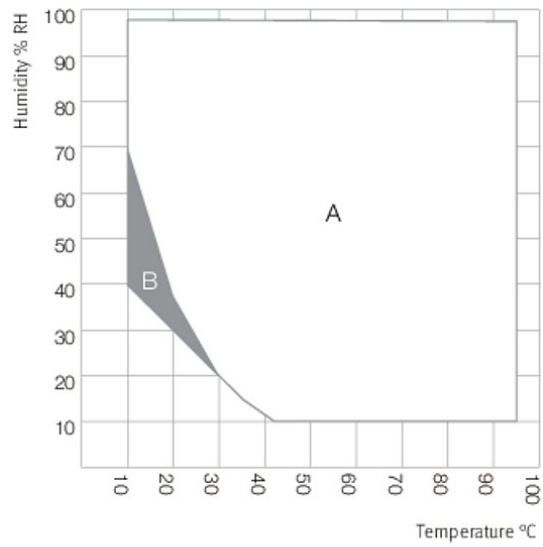
DIMENSIONS INCL. FITTINGS AND CONNECTIONS [MM]



CHARTS

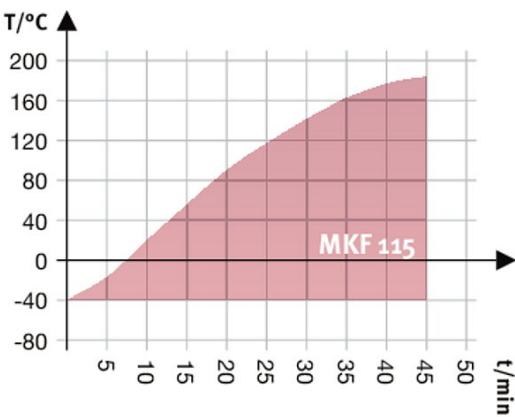


A: Standard Climate range  
B: Extended range with dry-air purge



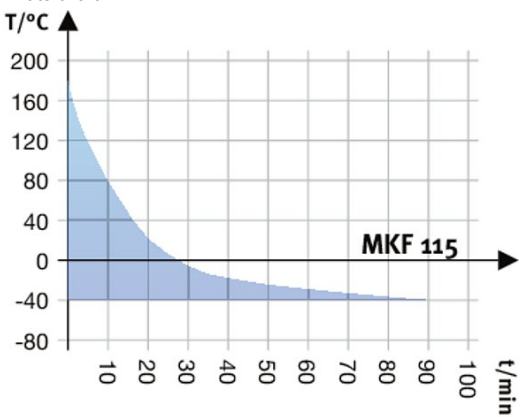
A: Standard Climate range  
B: Time-limited operation (max. 24 hours)

Climate chart

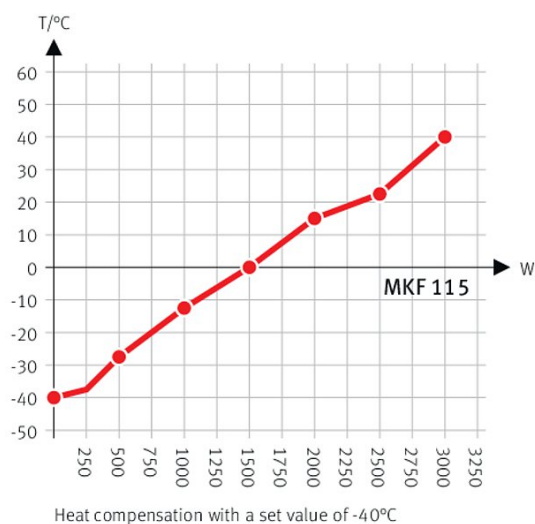


Heating up rate

Climate chart



Cooling down rate



Heat compensation chart

## OPTIONS

| Designation                                       | Description   | *      | Art.-No.  |
|---|---|--------|-----------|
|   | left  |        |           |
|   | 30 mm   | 01     | 8012-1323 |
|   | 50 mm   | 01     | 8012-1329 |
|   | 80 mm   | 01     | 8012-1335 |
|   | 100 mm  | 01, 11 | 8012-1543 |
|   | 125 mm  | 01, 11 | 8012-1352 |
|   | right   |        |           |
| Access port with silicone plug                    | 30 mm   | 01     | 8012-1320 |
|   | 50 mm   | 01     | 8012-1326 |
|   | 80 mm   | 01     | 8012-1332 |
|   | 100 mm  | 01, 11 | 8012-1540 |
|   | 125 mm  | 01, 11 | 8012-1349 |
|   | top   |        |           |
|   | 80 mm   | 01     | 8012-1537 |
|   | 100 mm  | 01, 11 | 8012-1531 |
|   | 125 mm  | 01, 11 | 8012-1534 |
| Analog output 4-20 mA                             | for temperature and humidity values (output not adjustable)   | -      | 8012-1085 |
| Calibration certificate, expanded                 | for temperature and humidity; for extending the measurement in center of chamber to include another test value  | -      | 8012-1194 |
| Calibration certificate, temperature              | temperature measurement incl. certificate and 27 measuring points at specified temperature  | -      | 8012-1609 |
|   | temperature measurement incl. certificate, 15- 18 measuring points at specified temperature   | -      | 8012-1589 |
|   | temperature measurement incl. certificate, 9 measuring points at specified temperature  | -      | 8012-1568 |
| Calibration certificate, temperature and humidity | Measurement in center of chamber at 25 °C / 60% RH or at specified test values  | -      | 8012-1188 |
|   | temperature (according to DIN12880) and humidity measurement incl. certificate, 27 temperature measuring points and 1 humidity measuring point, at 25 °C / 60 % RH or at specified values | -      | 8012-1615 |
| Door lock   | lockable door handle  | -      | 8012-1862 |
| Dry-air purge                                     | controlled, incl. connection; suitable for the simulation of current automobile industry standards  | -      | 8012-1863 |
| Dry-air purge, connection                         | for the connection to an existing pressurized air network   | -      | 8012-1802 |
| Notch-type access port                            | notch-type access port in door, 100 x 35 mm   | -      | 8012-1853 |
| Pt 100 temperature sensor                         | additional flexible Pt 100, interior, for displaying the temperature on the unit display  | -      | 8012-1094 |

\* Notes &gt; See last page

| Designation                       | Description  | * | Art.-No.  |
|-----------------------------------|--|---|-----------|
| RS 485 interface, 2-wire          | Additional serial interface can be used parallel to Ethernet, for Multi Management Software APT-COM™ | - | 8012-1769 |
| Temperature safety device class 2 | with visual alarm (DIN 12880)  | - | 8012-1864 |
| Water circuit                     | allows condensed water to be reused  | - | 8012-1512 |
| Water cooling                     | for reduced heat loss to ambient air   | - | 8012-0843 |

\* Notes › See last page

## ACCESSORIES

| Designation                           | Description  | *  | Art.-No.  |
|---------------------------------------|--|----|-----------|
| APT-COM™ 4 GLP-Edition                | for working under GLP-compliant conditions. Measured values are documented in a tamper-proof way in line with the requirements of FDA Regulation 21 CFR 11.<br>version 4, GLP edition  | 19 | 9053-0042 |
| APT-COM™ 4 PROFESSIONAL-Edition       | convenient unit and user management built on the BASIC edition. Suitable for networking up to 100 units.<br>version 4, PROFESSIONAL edition  | 19 | 9053-0040 |
| BINDER PURE AQUA SERVICE              | System for preparation or complete desalination of tap water, complete set containing PURE AQUA 300 single-use cartridge, measuring device, and all necessary connecting parts   | -  | 8012-0759 |
| BINDER PURE AQUA SERVICE, accessories | Single-use, replacement cartridge for BINDER PURE AQUA System  | -  | 6011-0165 |
| Data Logger Kit                       | T 220: For continuous temperature logging from -90 °C to 220 °C. The kit includes 1 data logger, Pt 100 sensor with 2 m extension cable and 1 magnetic fixture for mounting to the BINDER unit   | 19 | 8012-0715 |
|                                       | TH 100/70: For continuous temperature and humidity logging from -40 °C to 100 °C / 0% to 100% RH and additional logging of ambient conditions. Kit includes 1 data logger, 2 attachable combined humidity/temperature sensors, 2 m extension cable and 1 fixture for mounting to the BINDER unit | 19 | 8012-1838 |
|                                       | TH 100: For continuous temperature and humidity logging from -50 °C to 100 °C; 0% to 100% RH. Kit includes 1 data logger, Pt 100 sensor with 2 m extension cable, and 1 magnetic fixture for mounting to the BINDER unit   | 19 | 8012-1837 |
| pH-neutral detergent                  | concentrated, for gentle remove of residual contaminants; 1 kg   | -  | 1002-0016 |
| Qualification documents               | IQ/OQ documents – supporting documents for validation performed by customers, consisting of: IQ/OQ checklists incl. calibration guide and comprehensive unit documentation; parameters: temperature and humidity values<br>Digital in PDF format   | -  | 7057-0002 |
|                                       | Hard copy inside folder  | -  | 7007-0002 |
|                                       | IQ/OQ/PQ documents – supporting documents for validation performed by customers, according to customer requirements, PQ section added to qualification folder IQ/OQ; parameters: temperature and humidity values<br>Digital in PDF format  | -  | 7057-0006 |
|                                       | Hard copy inside folder  | -  | 7007-0006 |
| Rack                                  | stainless steel  | -  | 6004-0008 |
| Rack accessories                      | fasteners (1 set of 4) for additional security of racks  | -  | 8012-0620 |
| Rack, reinforced                      | stainless steel, with fasteners (1 set of 4)   | -  | 8012-0709 |
| RS 485 / RS 422 interface converter   | RS 422 cable set and RS 485 / RS 422 interface converter for connection to 10-way plug distributor<br>115 V option model   | -  | 8012-0599 |
|                                       | 230 V option model   | -  | 8012-0589 |
| Shelf, perforated                     | Stainless steel  | -  | 6004-0030 |

\* Notes › See last page

## SERVICES

| Designation                   | Description  | *      | Art.-No.  |
|-------------------------------|--|--------|-----------|
| <b>Installation services</b>  |  |        |           |
| Unit installation             | Unpacking and setting up of unit, connecting to existing connections, and checking function                                  | 13, 18 | DL10-0300 |
| Unit instructions             | Unit function instructions for operation and programming of the controller   | 18     | DL10-0700 |
| <b>Preventive maintenance</b> |  |        |           |
| Maintenance                   | Functional testing of all electrical and mechanical components, short calibration, documentation in the maintenance schedule | 14, 18 | DL20-0500 |

\* Notes › See last page

| Designation  | Description  | *              | Art.-No.  |
|--|--|----------------|-----------|
| <b>Calibration services</b>  |  |                |           |
| Temperature and humidity calibration   | Expansion – including certificate, each additional measuring point in center of chamber at 25 °C / 60% RH or at specified values   | 14, 16, 17, 18 | DL30-0302 |
|  | Temperature and humidity calibration with 1 measuring point in center of chamber with 1 specified pair of values, including certificate  | 14, 16, 17, 18 | DL30-0301 |
| Temperature measurement in accordance with DIN 12880, 27 temperature measuring points and 1 humidity measuring point | Temperature measurement in accordance with DIN 12880 with 27 temperature measuring points and 1 humidity measuring point in center of chamber at specified values, including certificate | 14, 16, 17, 18 | DL30-0427 |
| Temperature measurement, 18 temperature measuring points and 1 humidity measuring point                              | Temperature measurement with 18 temperature measuring points and 1 humidity measuring point in center of chamber with 1 specified pair of values, including certificate                  | 14, 16, 17, 18 | DL30-0318 |
| Temperature measurement, 27 temperature measuring points and 1 humidity measuring point                              | Temperature measurement with 27 temperature measuring points and 1 humidity measuring point in center of chamber with 1 specified pair of values, including certificate                  | 14, 16, 17, 18 | DL30-0327 |
| Temperature measurement, 9 temperature measuring points and 1 humidity measuring point                               | Temperature measurement with 9 temperature measuring points and 1 humidity measuring point in center of chamber at specified values, including certificate                               | 14, 16, 17, 18 | DL30-0309 |
| <b>Validation services</b>   |  |                |           |
| Execution of IQ/OQ   | Execution of IQ/OQ in accordance with qualification folder   | 15, 18         | DL42-0300 |
| Execution of IQ/OQ/PQ  | Execution of IQ/OQ/PQ in accordance with qualification folder  | 15, 18         | DL44-0500 |
| <b>Warranty service</b>  |  |                |           |
| Warranty extension from 2 to 3 years   | The warranty is extended from 2 to 3 years from the delivery date, wear parts are excluded   | –              | DL01-3041 |
| Warranty extension from 2 to 5 years   | The warranty is extended from 2 to 5 years from the delivery date, wear parts are excluded   | –              | DL01-3042 |

\* Notes › See last page

## NOTES

- 01 Condensation may occur in the area around the access port. Access ports may be placed in custom locations for an additional charge.
- 02 UL mark is not granted when this option is used.
- 03 Heat resistant only to max. 200 °C.
- 04 Only available on units rated for 230 V.
- 07 The additional heat input may affect the temperature behavior.
- 09 Not in conjunction with the optional access port, door with window and interior lighting.
- 10 Not available on 23-liter units.
- 11 Not available on 23- or 53-liter units.
- 12 Only available on units rated for 230 V or 400 V.
- 13 Installation and connections take place at unit location; transport within the company only upon consultation.
- 14 We recommend a BINDER service contract to cover unit inspections, calibrations and validations.
- 15 OQ according to Yellow Paper = completed factory validation documentation of all OQ checklists.
- 16 Sensor calibration is performed in an accredited calibration laboratory.
- 17 Calibration is performed according to the BINDER factory standard.
- 18 Quoted prices do not include travel costs. Please refer to the chapter on BINDER Service for travel costs for your region. Quoted prices for services performed in Switzerland do not include a country-specific added fee (available on request).
- 19 For additional accessories, refer to the Process documentation chapter.

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